

## REMARKS

The Office Action dated December 18, 2003, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Claims 7-10 are allowed. Claims 1-6 are respectfully submitted for consideration.

The Applicants wish to thank the Examiner for allowing claims 7-10 indicating allowable subject matter in claims 2, 3/1-2, 4/3/1-2 and 5/2. These claims were not placed in independent form as they depend from claim 1, which is allowable for the reasons submitted below.

Claims 1, 5/1 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pu (U.S. Patent No. 6,034,377) in view of Akiyama. Pu was cited for disclosing many of the claimed elements of the invention with the exception of a plurality of scan electromagnets provided on an entrance side of a final deflection electromagnet. Akiyama was cited for curing this deficiency. The Applicants' submit that claims 1, 5/1 and 6 recite subject matter that is neither disclosed nor suggested by the combination Pu and Akiyama.

Claims 1 and 6 recite a plurality of scan electromagnets provided on an entrance side of a final deflection electromagnet, and kicks provided by the plurality of scan electromagnets are superimposed to form a collimated irradiation field at an exit of the final deflection electromagnet. As a preliminary matter, the Office Action acknowledged that Pu fails to disclose a plurality of scan electromagnets provided on an entrance side of a final deflection electromagnet. As such, Pu fails to disclose kicks provided by the plurality of scan electromagnets are superimposed to form a collimated irradiation field at an exit of the final deflection electromagnet. The Applicants also submit that Pu fails

to disclose kicks provided by the plurality of scan electromagnets recited in claim 1. The Applicants further submit that there is no disclosure or suggestion that the scanning electromagnet 17 in Pu provides a kick.

Akiyama fails to cure the deficiencies in Pu. Akiyama discloses that scan electromagnets 100, 110 work in X and Y directions independently. As shown in Fig. 5A of Akiyama, the charged particle beam is deflected by the scan electromagnet 100 and the quadrapole electromagnets 4 and 5; however, the scan electromagnet 110 is not used to kick. In Fig. 5B, the charged particle beam is deflected by the scan electromagnet 110, the quadrapole electromagnet 5, and the bending electromagnet 9; however, the scan electromagnet 100 is not used to kick. Therefore, no parallel beam is obtained at the exit of the final deflection electromagnet 9 by superimposing mutual kicks by the scan electromagnets 100, 110. As such, Akiyama only discloses one kick provided by one scanning electromagnet, either 100 or 110, but not both. Since neither Pu nor Akiyama disclose or suggest kicks provided by a plurality of scan electromagnets superimposed to form a collimated irradiation field, the combination of references fails to disclose or suggest each and every feature of the invention as recited in claim 1, and therefore, claims 5/1 and 6.

Also, with respect to claims 1 and 6, the Applicants respectfully submit that the Office Action has not provided a proper motivation for combining Pu and Akiyama to modify Pu in the manner suggested. Claims 1 and 6 recite a plurality of scan electromagnets provided on an entrance side of a final deflection electromagnet. As noted above, the Office Action acknowledged that Pu does not disclose the plurality of scan electromagnets. The Office Action took the position that "it would have been

obvious for one having ordinary skill in the art at the time the invention was made to include a plurality of scan electromagnets disposed upstream from said deflection electromagnet as disclosed by Akiyama et al. into the charged particle beam irradiation apparatus disclosed by Pu. The motivation of doing so is to reduce the power consumption of a scanning electromagnet by narrowing the gap between magnetic poles of the scanning electromagnet as taught by Akiyama.” (Emphasis added) See page 3 of the Office Action.

The Office Action cited col. 1, lines 64-67 of Akiyama for the above-stated motivation. However, the Office Action’s motivation is not supported by the Akiyama reference. Col. 1, lines 64-67 and col. 2, lines 1-11 of Akiyama disclose that the apparatus is capable of reducing power consumption by placing a quadrupole electromagnet between two of the scanning electromagnets. There is no disclosure or suggestion in Akiyama that the quadrupole electromagnet is a scan electromagnet that provides a kick. Therefore, the reduction of power consumption in Akiyama is a result of placement of the quadrupole electromagnet, not providing multiple scanning electromagnets as suggested in the Office Action, because the quadrupole electromagnet is not disclosed as a scanning electromagnet. As such, there is no disclosure or suggestion of a plurality of scan electromagnets provided on an entrance side of a final deflection electromagnet to scan a charged-particle beam to expand an irradiation field as recited in claim 1. Therefore, there is no motivation either in the references themselves or the knowledge generally available to one of ordinary skill in the art to include a plurality of scan electromagnets in Pu.


Under U.S. patent practice, the PTO has the burden under §103 to establish a *prima facie* case of obviousness. In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Both the case law of the Federal Circuit and the PTO itself have made clear that where a modification must be made to the prior art to reject or invalidate a claim under §103, there must be a showing of proper motivation to do so. The mere fact that a prior art reference could arguably be modified to meet the claim is insufficient to establish obviousness. The PTO can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. Id. In order to establish obviousness, there must be a suggestion or motivation in the reference to do so. See also In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (prior art could not be turned upside down without motivation to do so); In re Rouffet, 149 F.3d 1350 (Fed. Cir. 1998); In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Lee, 277 F.3d 1338 (Fed. Cir. 2002). The Office Action restates the advantages of the present invention to justify the combination of references. There is, however, nothing in the applied references to evidence the desirability of these advantages in the disclosed structure.

For at least the combination of foregoing reasons, the Applicants respectfully submit that the combination of Pu and Akiyama fails to disclose or suggest the present invention as claimed in claims 1, 5/1 and 6. Accordingly, the Applicants respectfully request allowance of claims 1-6 and the prompt issuance of a Notice of Allowability.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Docket. No. 107292-00023.**

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rhonda L. Barton", written over a horizontal line.

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